

Name: \_\_\_\_\_ Date: \_\_\_\_\_

### Polynomial Factoring solution (version 605)

1. The quadratic formula says if  $ax^2 + bx + c = 0$  then  $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ . Use the quadratic formula to solve the following equation.

$$x^2 + 10x + 43 = 0$$

Simplify your answer(s) as much as possible.

**Solution**

$$x = \frac{-(10) \pm \sqrt{(10)^2 - 4(1)(43)}}{2(1)}$$

$$x = \frac{-(10) \pm \sqrt{100 - 172}}{2(1)}$$

$$x = \frac{-10 \pm \sqrt{-72}}{2}$$

$$x = \frac{-10 \pm \sqrt{-36 \cdot 2}}{2}$$

$$x = \frac{-10 \pm 6\sqrt{2}i}{2}$$

$$x = -5 \pm 3\sqrt{2}i$$

Notice that  $i$  is NOT under the square-root radical symbol!!

2. Express the product of  $4 + 3i$  and  $-9 + 5i$  in standard form  $(a + bi)$ .

**Solution**

$$\begin{aligned} & (4 + 3i) \cdot (-9 + 5i) \\ & -36 + 20i - 27i + 15i^2 \\ & -36 + 20i - 27i - 15 \\ & -36 - 15 + 20i - 27i \\ & -51 - 7i \end{aligned}$$

### Polynomial Factoring solution (version 605)

3. Write function  $f(x) = x^3 - 4x^2 - 11x + 30$  in factored form. I'll give you a hint: one factor is  $(x - 5)$ .

**Solution**

$$\begin{array}{c|cccc} & 1 & -4 & -11 & 30 \\ 5 & & 5 & 5 & -30 \\ \hline & 1 & 1 & -6 & 0 \end{array}$$

$$f(x) = (x - 5)(x^2 + x - 6)$$

$$f(x) = (x - 5)(x + 3)(x - 2)$$

4. Polynomial  $p$  is defined below in factored form.

$$p(x) = -(x + 8)^2 \cdot (x + 5) \cdot (x + 1) \cdot (x - 3)^2$$

Sketch a graph of polynomial  $y = p(x)$ .

